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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/715,123	VOSBURGH ET AL.	
	Examiner	Art Unit	
	Jason R. Kurr	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 29 is objected to because of the following informalities: Claim 29 discloses "the identified one or more second set of sounds" in line 2 of the claim. There is insufficient antecedent basis for this limitation within the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 9-10, 19-23 and 25-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Algazi et al (US 2004/0076301 A1).

With respect to claim 1, Algazi discloses a method for generating a directional sound environment, the method comprising: providing a headgear unit (pg.9 [0091]) having a plurality of microphones thereon (fig.1 #14, pgs.3-4 [0029]); detecting a sound signal from the plurality of microphones; applying a transfer function to the sound signal

to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside the headgear unit (fig.1 #16, pg.6 [0058-0061]).

With respect to claim 2, Algazi discloses the method of claim 1, wherein the transfer function is based on an experimentally determined propagation effect from sound propagating to an opening of an ear canal and substantially omitting propagation interference from the headgear unit (pg.6 [0058-0061]).

With respect to claim 3, Algazi discloses the method of claim 1, further comprising generating sound inside the headgear unit responsive to the transformed sound signal (pg.4 [0031]).

With respect to claim 4, Algazi discloses the method of claim 1, wherein the headgear unit comprises a protective helmet (pg.9 [0091]). It is implied that a diver's helmet as disclosed by Algazi, functions to not only supply air to the diver but also to protect the diver's head.

With respect to claim 5, Algazi discloses the method of claim 1, wherein the plurality of microphones are positioned at locations on the headgear unit, the locations being selected to provide sufficient sound information to provide an approximation of

free field hearing sound (pgs.3-4 [0029]).

With respect to claim 6, Algazi discloses the method of claim 1, wherein applying a transfer function further comprises reducing the amplitude of a portion of the sound signal if the amplitude is higher than a threshold level (pgs.6-7 [0066-0067]). As the position of the listener's head changes the amplification coefficient w, changes accordingly which results in either an increase or decrease in the signal input from a respective microphone.

With respect to claim 7, Algazi discloses the method of claim 1, wherein applying a transfer function further comprises canceling the amplitude of portions of sound signals (pgs.6-7 [0066-0067]). Algazi discloses that the coefficient w can be within a range of 0 to1. If w = 0, this would result in a canceling of the amplitude of a sound signal from one of the microphones.

With respect to claim 9, Algazi discloses the method of claim 1, wherein the headgear unit is substantially sound proof in a frequency range. It is implied that a diver's helmet acts as a passive sound canceller, which is **substantially** sound proof within a frequency range.

With respect to claim 10, Algazi discloses a method for generating a directional sound environment, the method comprising: providing a plurality (pg.3 [0028]) of

headgear units (pg.9 [0091]), each headgear unit having a plurality of microphones thereon (fig.1 #14, pgs.3-4 [0029]); detecting a sound signal from the plurality of microphones on the plurality of headgear units; applying a transfer function to the sound signal to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside at least one of the headgear units (fig.1 #16, pg.6 [0058-0061]).

With respect to claim 19, Algazi discloses a device for generating a directional sound environment, the device comprising: a headgear unit (pg.9 [0091]) having plurality of microphones thereon (fig.1 #14, pgs.3-4 [0029]), the microphones configured to detect sound signals; a processor (fig.1 #16) in communication with the microphones configured to apply a transfer function to the sound signal to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside the headgear unit (pg.6 [0058-0061]); and a speaker (fig.1 #20,22) positioned in an interior portion of the headgear unit configured to generate the transformed sound inside the headgear unit.

With respect to claim 20, Algazi discloses the device of claim 19, wherein the transfer function is based on an experimentally determined propagation effect from sound propagating to an opening of an ear canal and substantially omitting propagation interference from the headgear unit (pg.6 [0058-0061]).

With respect to claim 21, Algazi discloses the device of claim 19, wherein the plurality of microphones are positioned at locations on the headgear unit, the locations being selected to provide sufficient sound information to provide the transformed sound (pgs.3-4 [0029]).

With respect to claim 22, Algazi discloses the device of claim 19, wherein the processor is further configured to reduce the amplitude of a portion of the transformed sound if the amplitude is higher than a threshold level (pgs.6-7 [0066-0067]). As the position of the listener's head changes the amplification coefficient w, changes accordingly which results in either an increase or decrease in the signal input from a respective microphone.

With respect to claim 23, Algazi discloses the device of claim 19, wherein the processor is further configured to cancel the amplitude of selected sound signals (pgs.6-7 [0066-0067]). Algazi discloses that the coefficient w can be within a range of 0 to1. If w = 0, this would result in a canceling of the amplitude of a sound signal from one of the microphones.

With respect to claim 25, Algazi discloses the device of claim 19, wherein the headgear unit comprises a helmet (pg.9 [0091]).

With respect to claim 26, Algazi discloses a method for preparing a directional sound environment, the method comprising: providing a plurality of sound sources (fig.1 #20,22) at a first set of locations and a plurality of sound receivers (fig.1 #14) at a second set of locations, the second set of locations being positioned on a headgear unit (pg.9 [0091]); generating a first set of sounds at the plurality of sound sources (pg.4 [0031]); receiving sound signals at the plurality of sound receivers, the sound signals being a result of sound propagation from the sound sources to the sound receivers; and identifying one or more of the received signals to provide an approximation of the first set of sounds (pg.4 [0034]).

With respect to claim 27, Algazi discloses the method of claim 26, further comprising processing the received signals to provide a transfer function representing differences between the first set of sounds and the received signals (fig.1 #16, pg.6 [0058-0061]).

With respect to claim 28, Algazi discloses the method of claim 26, wherein the identifying one or more of the received signals comprises: combining the received signals to provide a combined signal; and selecting one or more of the received signals selectively eliminating one or more of the received signals from a combined signal (pg.6 [0064-0065]).

With respect to claim 29, Algazi discloses the method of claim 26, further comprising selecting locations from the second set of locations based on the identified one or more second set of sounds (pg.6 [0058-0061]).

With respect to claim 30, Algazi discloses the method of claim 26, further comprising reducing the amplitude of a portion of the received signal if the amplitude is higher than a threshold level (pgs.6-7 [0066-0067]). As the position of the listener's head changes the amplification coefficient w, changes accordingly which results in either an increase or decrease in the signal input from a respective microphone.

With respect to claim 31, Algazi discloses the method of claim 26, further comprising canceling the amplitude of selected received signals (pgs.6-7 [0066-0067]). Algazi discloses that the coefficient w can be within a range of 0 to1. If w = 0, this would result in a canceling of the amplitude of a sound signal from one of the microphones.

With respect to claim 32, Algazi discloses the method of claim 26, further comprising determining a transfer function approximating sound proximate the headgear unit to reduce sound interference from the headgear unit (pg.4 [0031] "crosstalk cancellation").

With respect to claim 33, Algazi discloses the method of claim 26, further comprising identifying one or more of the second set of locations based on the identified

received signals (pg.6 [0059]).

With respect to claim 34, Algazi discloses the method of claim 26, wherein the headgear unit is substantially sound proof in a frequency range. It is implied that a diver's helmet acts as a passive sound canceller, which is **substantially** sound proof within a frequency range.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 11-18, 24 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Algazi et al (US 2004/0076301 A1) in view of Barker (US 4,638,410).

With respect to claim 8, Algazi discloses the method of claim 1, however does not disclose expressly wherein the headgear unit comprises a pinna positioned on an outer surface of the headgear unit.

Barker discloses a diving helmet wherein pinna (fig.1 #23) are positioned on the outer surface of the headgear unit for the purpose of mounting a toggle switch (col.2 ln.9-17).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the pinna of Barker on the diving helmet of Algazi.

The motivation for doing so would have been to mount the microphones of Algazi within recesses so as to prevent the microphones from protruding from the helmet. This would help to protect the microphones from being damaged during use.

With respect to claim 11, Algazi discloses a device for generating a directional sound environment, the device comprising: a headgear unit (pg.9 [0091]); one or more microphones (fig.1 #14, pgs.3-4 [0029]); and a speaker positioned in an interior of the headgear unit (fig.1 #20,22), wherein the microphone is configured to receive a sound signal and the speaker is configured to generate sound inside the headgear unit (pg.4 [0031]).

Algazi does not disclose expressly wherein the headgear unit comprises a pinna positioned on an outer surface of the headgear unit.

Barker discloses a diving helmet wherein pinna (fig.1 #23) are positioned on the outer surface of the headgear unit for the purpose of mounting a toggle switch (col.2 ln.9-17).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the pinna of Barker on the diving helmet of Algazi.

The motivation for doing so would have been to mount the microphones of Algazi within recesses so as to prevent the microphones from protruding from the helmet. This would help to protect the microphones from being damaged during use.

With respect to claim 12, Algazi discloses the device of claim 11, wherein the device further comprises a processor (fig.1 #16) configured to apply a transfer function to the received sound signal to provide a transformed sound signal, the transformed sound signal providing an approximation of free field hearing sound at a subject's ear inside the headgear unit (pg.6 [0058-0061]).

With respect to claim 13, Algazi discloses the device of claim 12, wherein the transfer function is based on an experimentally determined propagation effect from sound propagating to an opening of an ear canal and substantially omitting propagation interference from the headgear unit (pg.6 [0058-0061]).

With respect to claim 14, Algazi discloses the device of claim 12, wherein the plurality of microphones are positioned at locations on the headgear unit, the locations being selected to provide sufficient sound information to provide an approximation of free field hearing sound (pgs.3-4 [0029]).

With respect to claim 15, Algazi discloses the device of claim 12, wherein the processor is further configured to reduce an amplitude of a portion of the sound signal if the amplitude is higher than a threshold level (pgs.6-7 [0066-0067]). As the position of the listener's head changes the amplification coefficient w, changes accordingly which

results in either an increase or decrease in the signal input from a respective microphone.

With respect to claim 16, Algazi discloses the device of claim 12, wherein the processor is further configured to cancel the amplitude of a portion of the sound signal (pgs.6-7 [0066-0067]). Algazi discloses that the coefficient w can be within a range of 0 to1. If w = 0, this would result in a canceling of the amplitude of a sound signal from one of the microphones.

With respect to claim 17, Algazi discloses the device of claim 12, wherein the headgear unit comprises a helmet (pg.9 [0091]).

With respect to claim 18, Algazi discloses the device of claim 11, wherein the headgear unit is substantially soundproof in a frequency range. It is implied that a diver's helmet acts as a passive sound canceller, which is **substantially** sound proof within a frequency range.

With respect to claim 24, Algazi discloses the method of claim 19, however does not disclose expressly wherein the headgear unit comprises a pinna positioned on an outer surface of the headgear unit.

Barker discloses a diving helmet wherein pinna (fig.1 #23) are positioned on the outer surface of the headgear unit for the purpose of mounting a toggle switch (col.2 ln.9-17).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the pinna of Barker on the diving helmet of Algazi.

The motivation for doing so would have been to mount the microphones of Algazi within recesses so as to prevent the microphones from protruding from the helmet. This would help to protect the microphones from being damaged during use.

With respect to claim 35, Algazi discloses the method of claim 26, however does not disclose expressly wherein the headgear unit comprises a pinna positioned on an outer surface of the headgear unit.

Barker discloses a diving helmet wherein pinna (fig.1 #23) are positioned on the outer surface of the headgear unit for the purpose of mounting a toggle switch (col.2 ln.9-17).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the pinna of Barker on the diving helmet of Algazi.

The motivation for doing so would have been to mount the microphones of Algazi within recesses so as to prevent the microphones from protruding from the helmet. This would help to protect the microphones from being damaged during use.

With respect to claim 36, Algazi discloses the method of claim 35, further comprising positioning at least sound receiver on the pinna (See rejection of claim 35).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ishii (US 2001/0021257 A1) discloses a stereophonic sound field reproduction apparatus.

Tabata (US 6,862,358 B1) discloses a speaker built into a helmet.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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